

WINDOW

AUTISM SIMULATION

Experiencing Autism - Challenging Misconceptions and Stereotypes with Virtual Reality

Research Thesis

Presented in partial fulfillment of the requirements for graduation with research distinction in
Industrial Design in the undergraduate colleges of The Ohio State University

by
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The Ohio State University
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My thesis is about raising awareness of the challenges children with Autism face while participating in sports.

For the past two years, I have been a member of Empower Sports at The Ohio State University. Empower Sports facilitates opportunities for children with Autism to get a better grasp on their physical and social wellness through engagement with fitness and a commitment to fostering meaningful relationships with their peers in the community.

Through this experience, I have seen first-hand the challenges children with Autism can face while trying to participate in sports. Therefore, this semester I decided to explore this topic and see how I could make an impact in their lives.

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Personal Experience

I have seen first-hand the challenges children with Autism can face while trying to participate in sports.

This past semester at Empower Sports at Ohio State, I was able to work with a 4-year-old boy who was nonverbal. He had the most challenges with yoga, because he did not understand where or how to place his body. When he would get frustrated with an activity, he would sometimes have breakdowns and needed a few minutes to himself before we could continue with the activity.





“Just because you have one kid with Autism means nothing when it comes to the next kid.”

- Dee Marks, Parent Mentor for Dublin City Schools



AUTISM AND SPORTS

February 2, 2016 | 2 Comments | [Practical Parenting](#) | [athlete, athletics, autism and sports, autism coach, coach, coaching, sports](#)



The benefits of competitive sports are accessible to all children, even those on the autism spectrum. If your child shows an interest in sports, that's great! There are many benefits to participating, including healthy exercise and learning important life skills like cooperation, teamwork, overcoming obstacles, and the rewards of hard work, among others. Parents may be apprehensive about signing up their autistic child for a particular sport, but with the right amount of support, these activities can turn into wonderful opportunities for social and emotional development. This article helps parents identify and address potential obstacles to sports success so they can advocate for their child's needs in the sports environment.

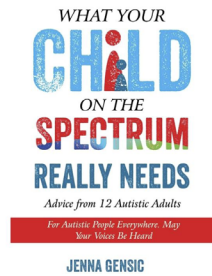
Challenges Autistic Children Face When Playing Sports

Autistic individuals tend to have a more difficult time enjoying and succeeding in sports than their neurotypical peers for a variety of reasons. This is usually the result of many environmental, structural, and physiological challenges and/or a lack of cooperation with coaches who aren't accommodating for their specific needs in these areas. Some of these reasons are issues that can (and should) be remedied if a child shows an interest in participating. Below is a list of some of these potential challenges:

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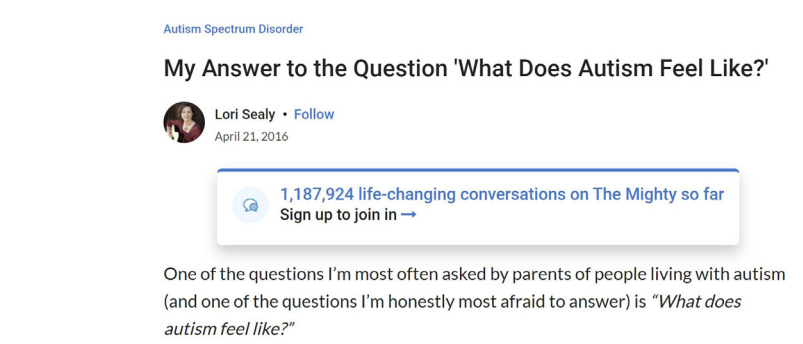
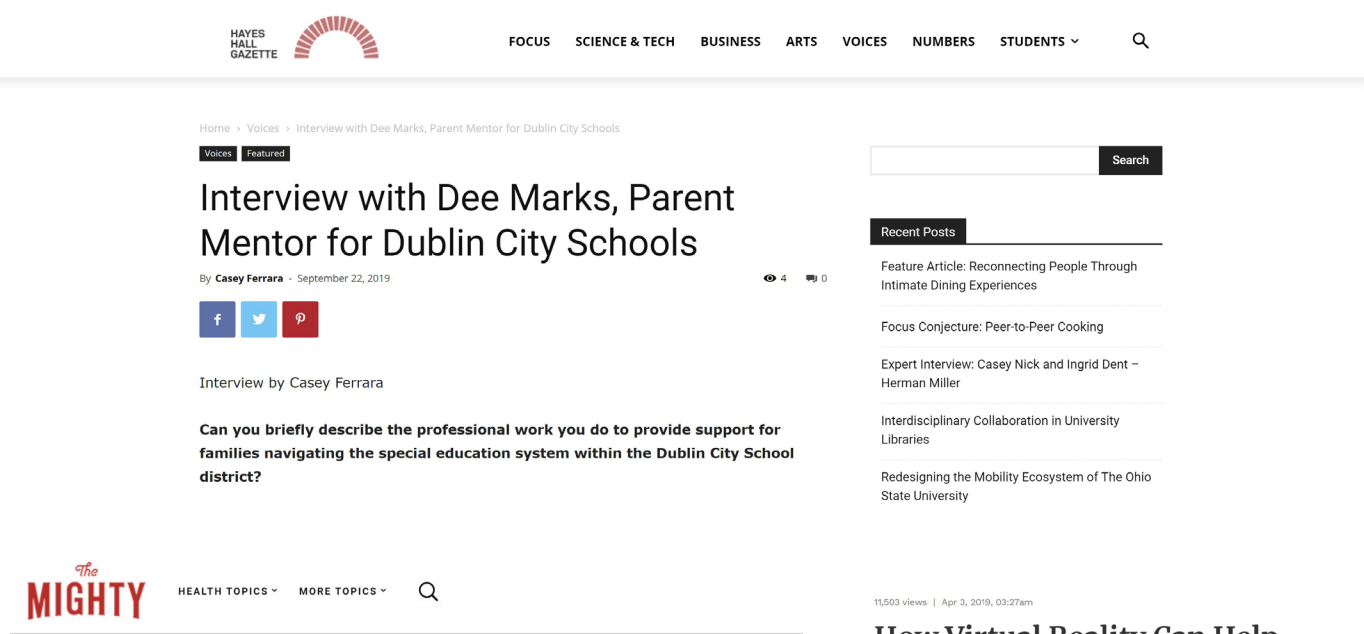
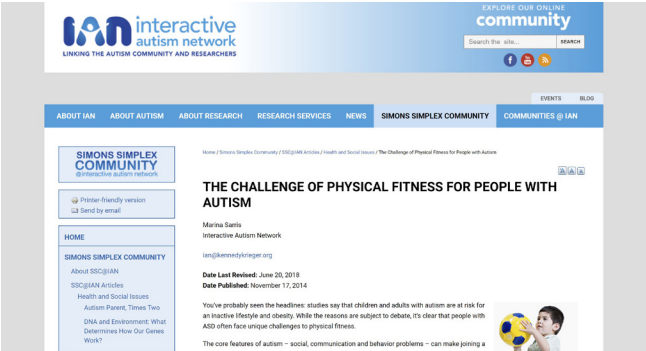
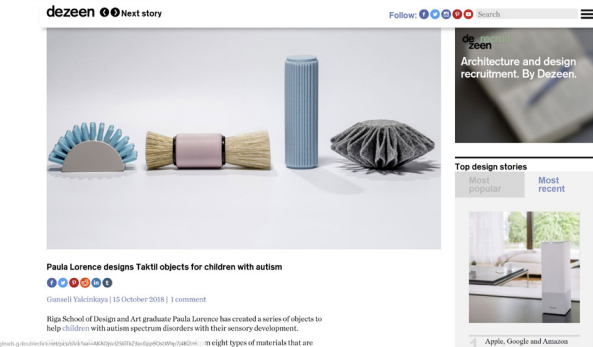
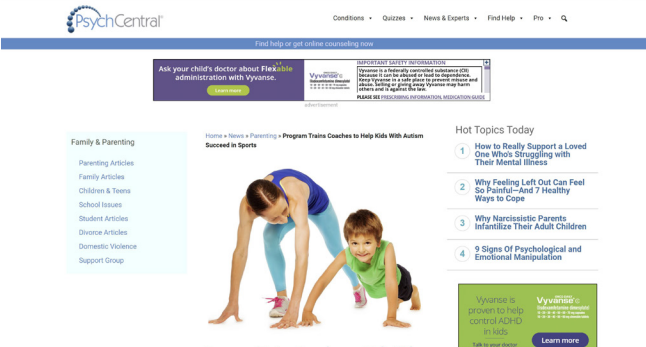
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How Virtual Reality Can Help Those With Autism



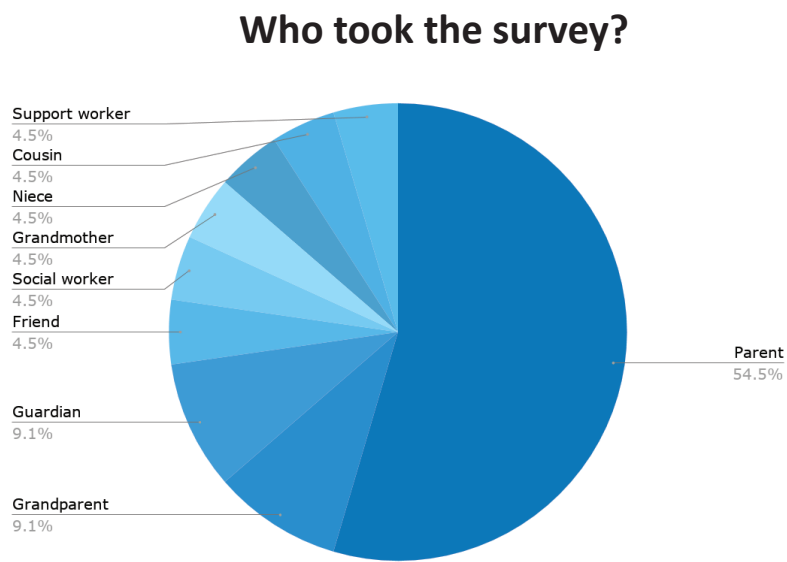
Sol Rogers Contributor
Consumer Tech

f Autism is what is known as a spectrum condition, meaning it affects individuals in different ways. Adults and children with autism have challenges in behavior, social skills, verbal and non-verbal communication, as well as sensory and attention issues that impact their lives. However, they also have unique identities, quirks, and preferences - just like anyone else.

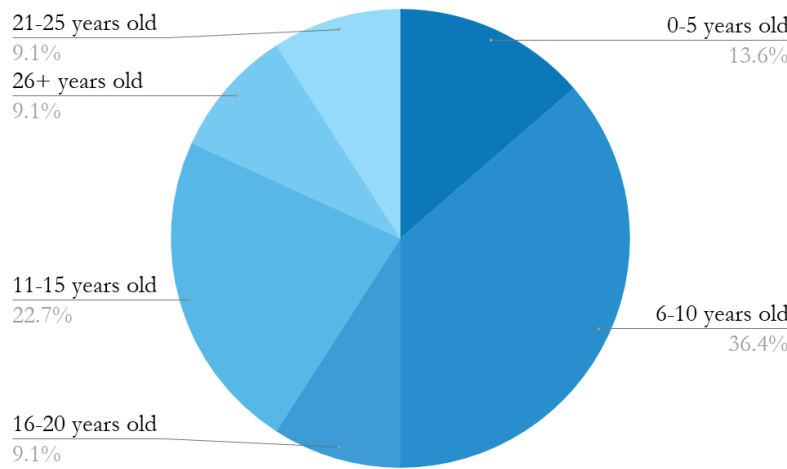
With World Autism Awareness Week taking place this week, it's a unique time for everyone to learn more about autism - from the general public to



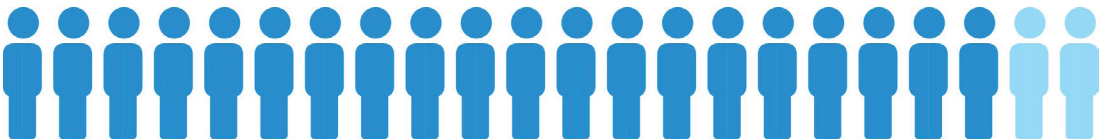
A survey was conducted to explore the challenges faced by children with Autism while participating in sports. There was a total of 22 responses to the survey.



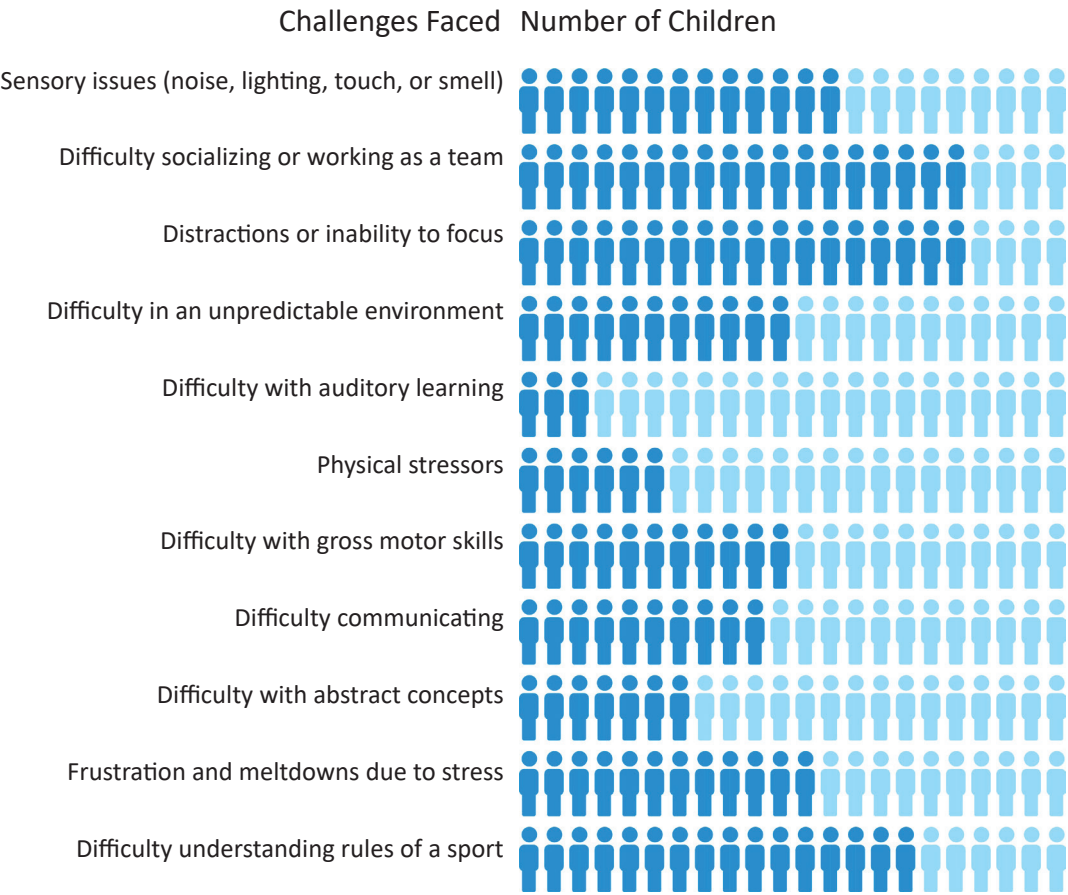
Over 70% of respondents said their child was between 0-15 years old.



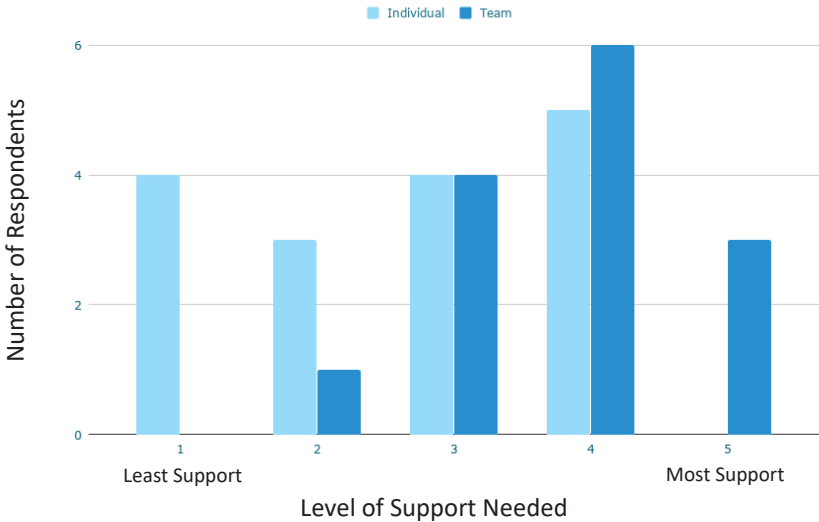
20 out of 22 respondents said their child faced challenges while trying to participate in sports.



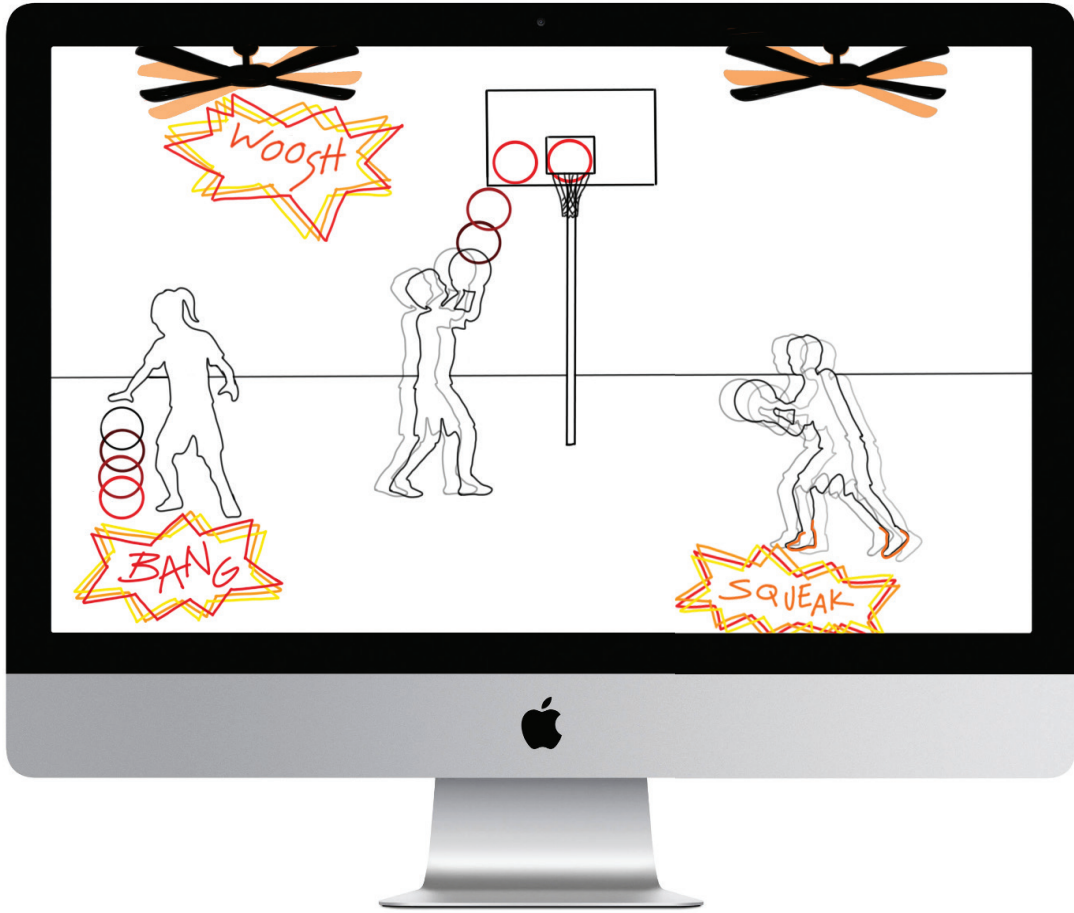
What challenges have children faced?



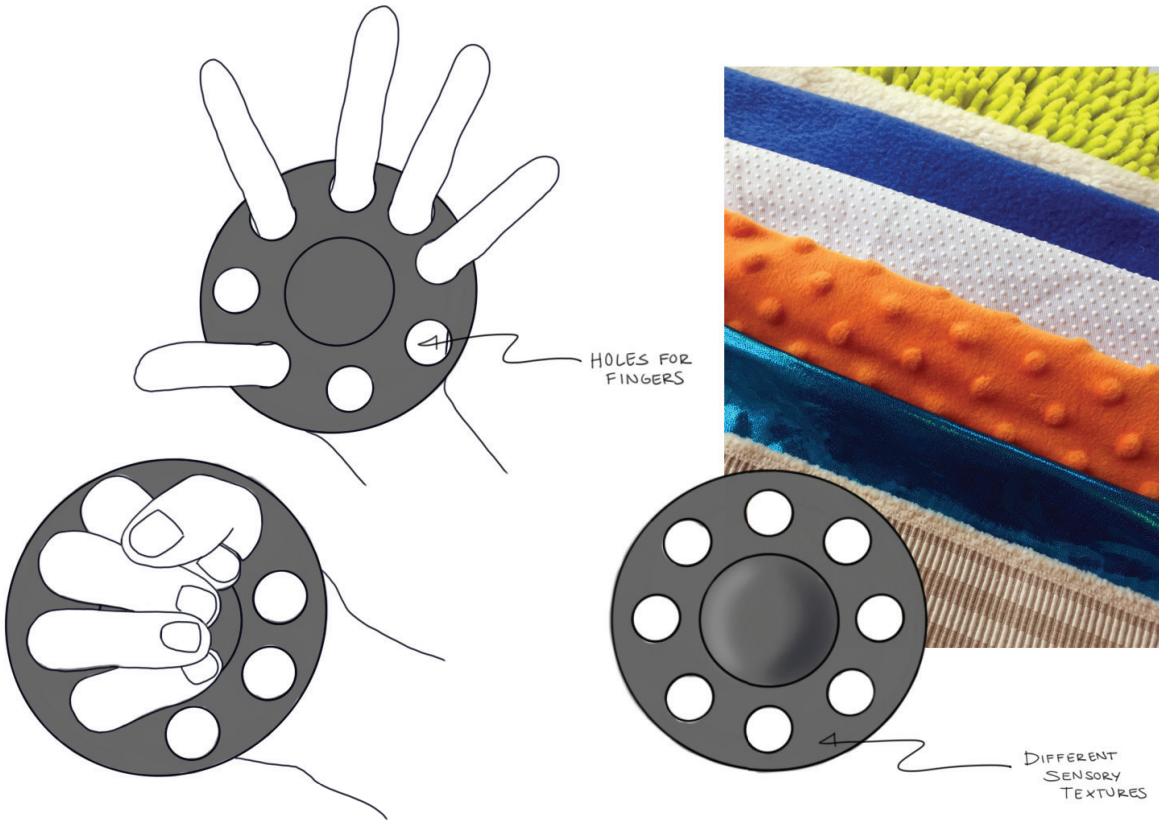
On average, respondents said their child needs more support in Team Sports than in Individual Sports.



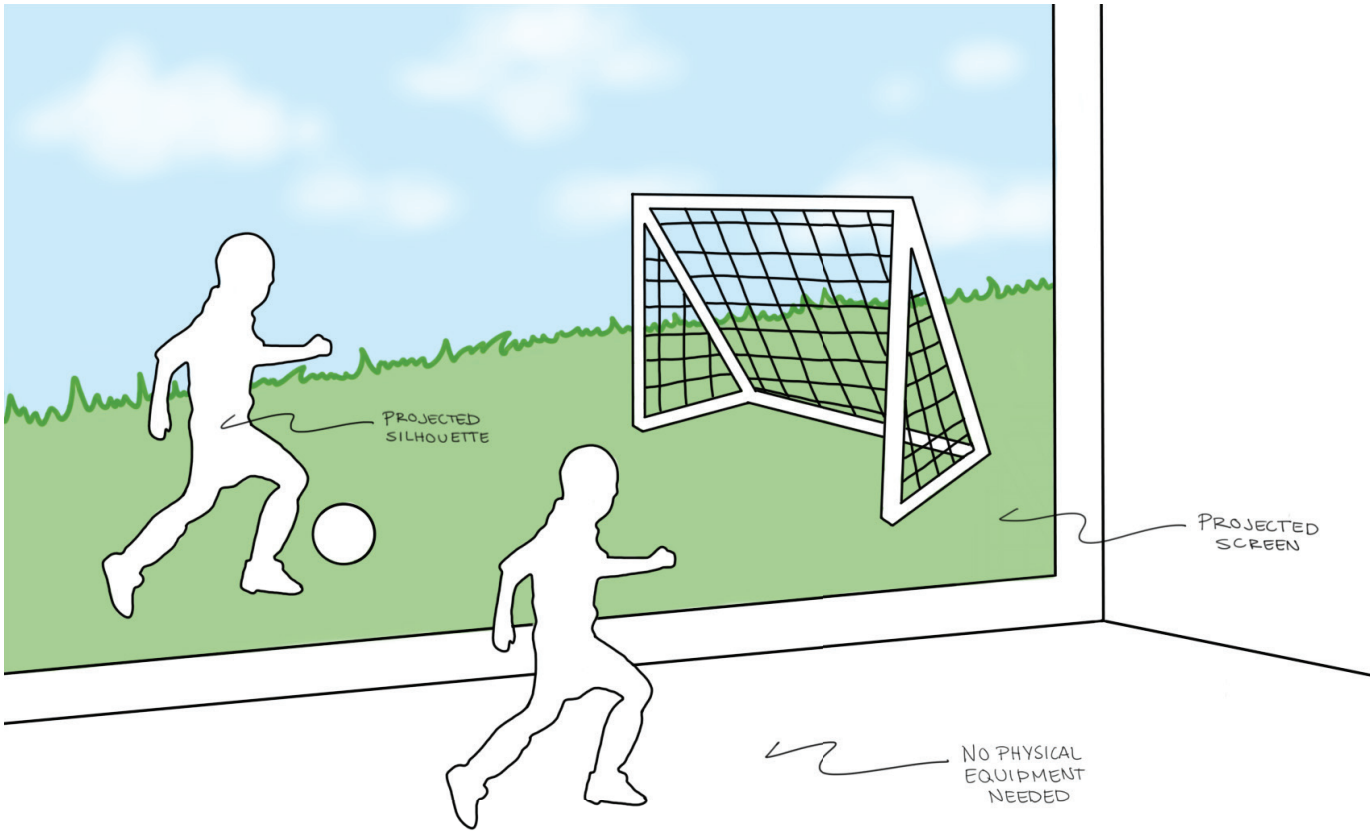
2 Initial Design Conjectures



Through this immersive experience, viewers will be able to gain a better understanding of what it is like to have Autism. The video would portray the challenges children with Autism face, such as sensory issues, difficulty focusing or socializing, and difficulty understanding rules of a sport.



Many children with Autism have trouble focusing while trying to participate in sports. Tactile objects can be used to help children with Autism with their sensory development. Feelz is a pack of sensory disks that can be worn on a user's hand in order to help improve focus and decrease distractions while playing sports.



Many children with Autism have difficulties with sensory overload and distractions while playing sports. With this virtual reality sports game, those who struggle with sensory overload can participate in sports without having to worry about certain cause and effect sensory issues.

Key Partners <div>Children with Autism</div> <div>Parents of children with Autism</div> <div>Caregivers/ Staff</div> <div>Specialized Teachers</div> <div>Peers</div>	Key Activites <div>Teach people how to teach those with Autism</div> <div>Provide tools to teach</div>	Value Proposition <div>Better understanding</div> <div>Engage in physical fitness</div> <div>Build social skills</div> <div>Develop gross and fine motor skills</div> <div>Learn independence</div> <div>Understand how to teach a child with Autism</div> <div>Understand a child's needs and skills</div>	Audience Relationships <div>Website information and instructions</div> <div>Tools to teach those with Autism</div>	Audience Segments <div>Families with children on the spectrum</div> <div>Educators of children on the spectrum</div> <div>Peers of children on the spectrum</div>
Core Structure <div>Website costs</div> <div>Social media and ads</div> <div>Experts to develop tools and assessments</div> <div>Researchers to continue reseach on new methods</div>			Distribution Channels <div>Website</div> <div>Word of mouth</div> <div>Social media and ads</div>	
			Revenue Stream <div>Charge for tools and assessments</div> <div>Charge for delivery</div> <div>Customers can review how well tools worked</div>	

This business model is focused around providing educational tools to help people better understand how to teach children with Autism how to play sports. This system would allow peers, parents or educators to order different kinds of educational starter kits online.

I decided to focus on the sensory issues children with Autism face while participating in sports.

Some of the most common problems children with Autism experience are their hyper- or hypo-sensitivities to sensory stimuli. Hypersensitivity is an over-responsiveness to sensory stimuli, whereas hyposensitivity is an under-responsiveness to sensory stimuli.

Most individuals with autism experience at least one form of hyper- or hyposensitivity of the five senses. These alterations in sensory-related behaviors can lead to profound limitations on a child’s ability to participate in leisure activities, like sports. Additionally, these atypical responses to otherwise normal sensory stimuli are closely associated with the core symptoms of Autism, such as social deficits and repetitive behaviors.



Hypersensitivity

Many people on the spectrum are hyper-sensitive to bright lights or certain light wavelengths. Many find certain sounds, smells and tastes overwhelming. Certain types of touch can also feel extremely uncomfortable.



Hyposensitivity

A low sensitivity to pain or an under-responsiveness to the body signals that help control balance and physical coordination can be seen in hyposensitivity. This can result in clumsiness, which has long been associated with Autism.

Testing Original Hypothesis

Distracting sights and sounds while playing sports will help raise awareness of the challenges children with Autism face when playing sports.

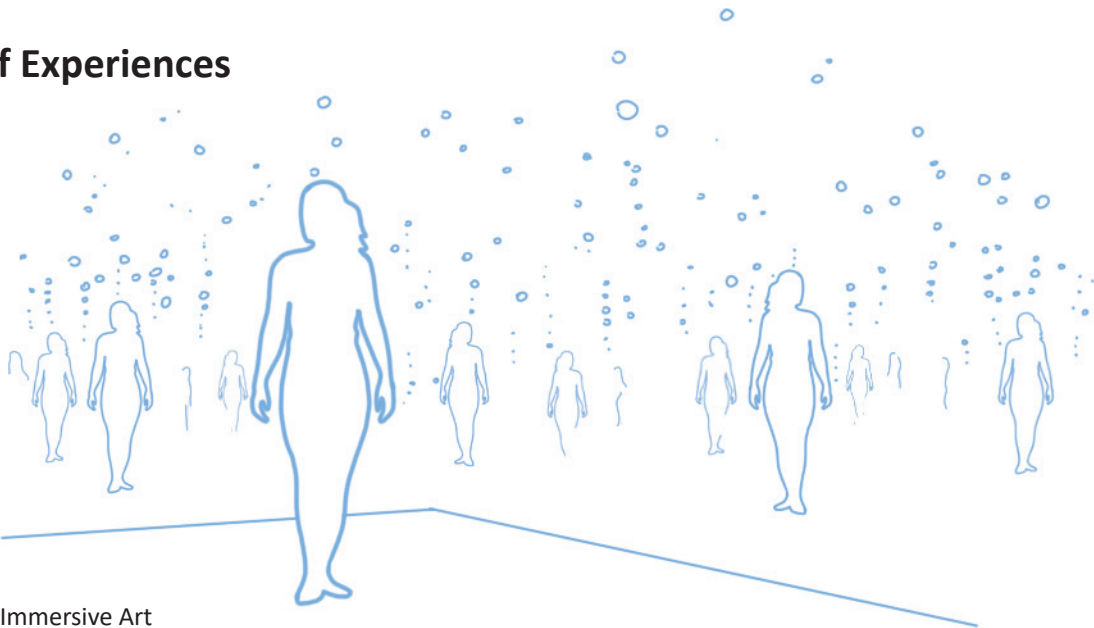
This was one of my original hypotheses that I tested. I was looking to see whether or not the experience that my users went through raised awareness of the challenges children on the spectrum face. I tested their knowledge before and after the activity to gain information. I was able to learn from the results of my assessment and was able to modify my hypothesis for the future.



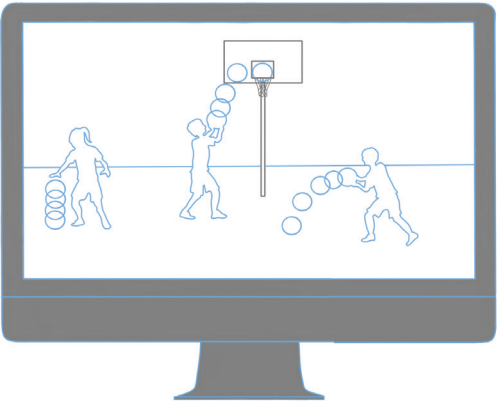
What type of experience will impact users the most?

I was looking to create an experience that would be very impactful on users. I needed an experience that would help raise awareness of the challenges children face as well as educate those on how to better work with children on the spectrum. I looked into many different types of experiences like immersive art, 4D and 3D movies and videos, and even roller-coaster rides.

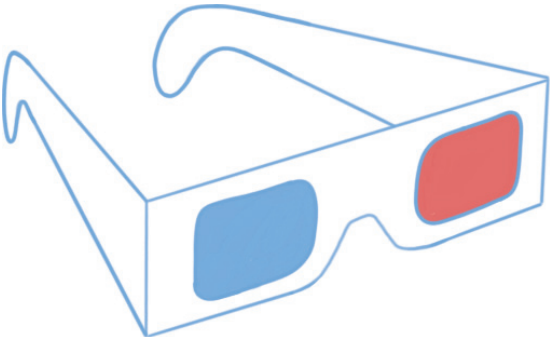
Types of Experiences



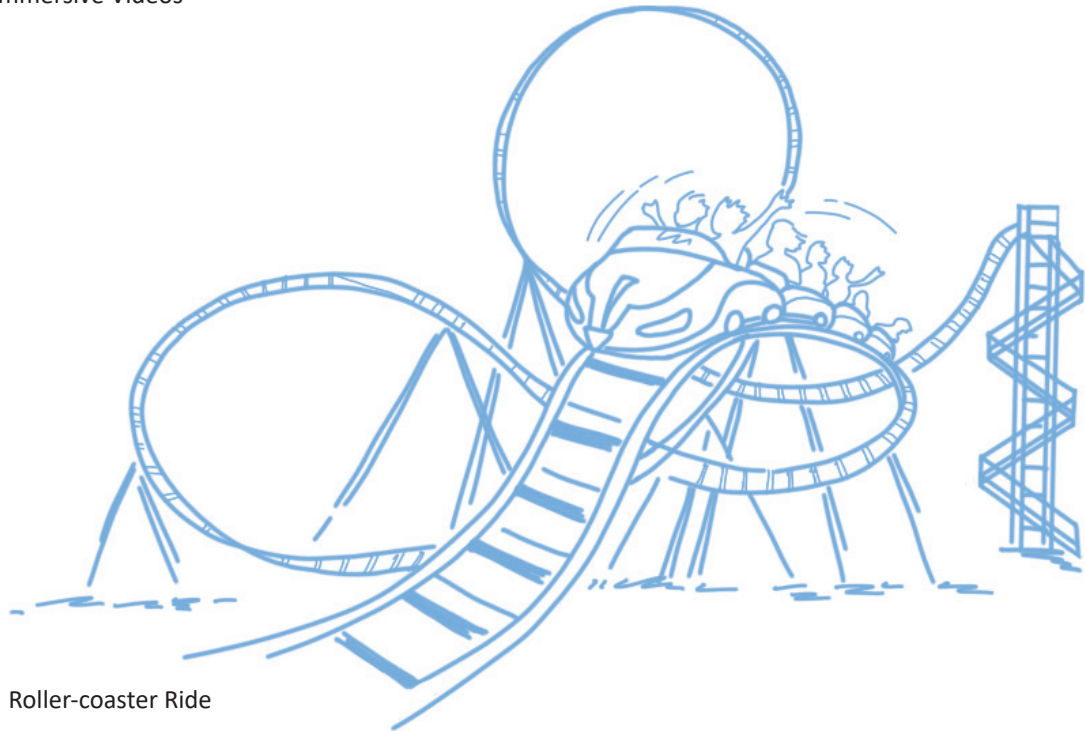
Immersive Art



Immersive Videos



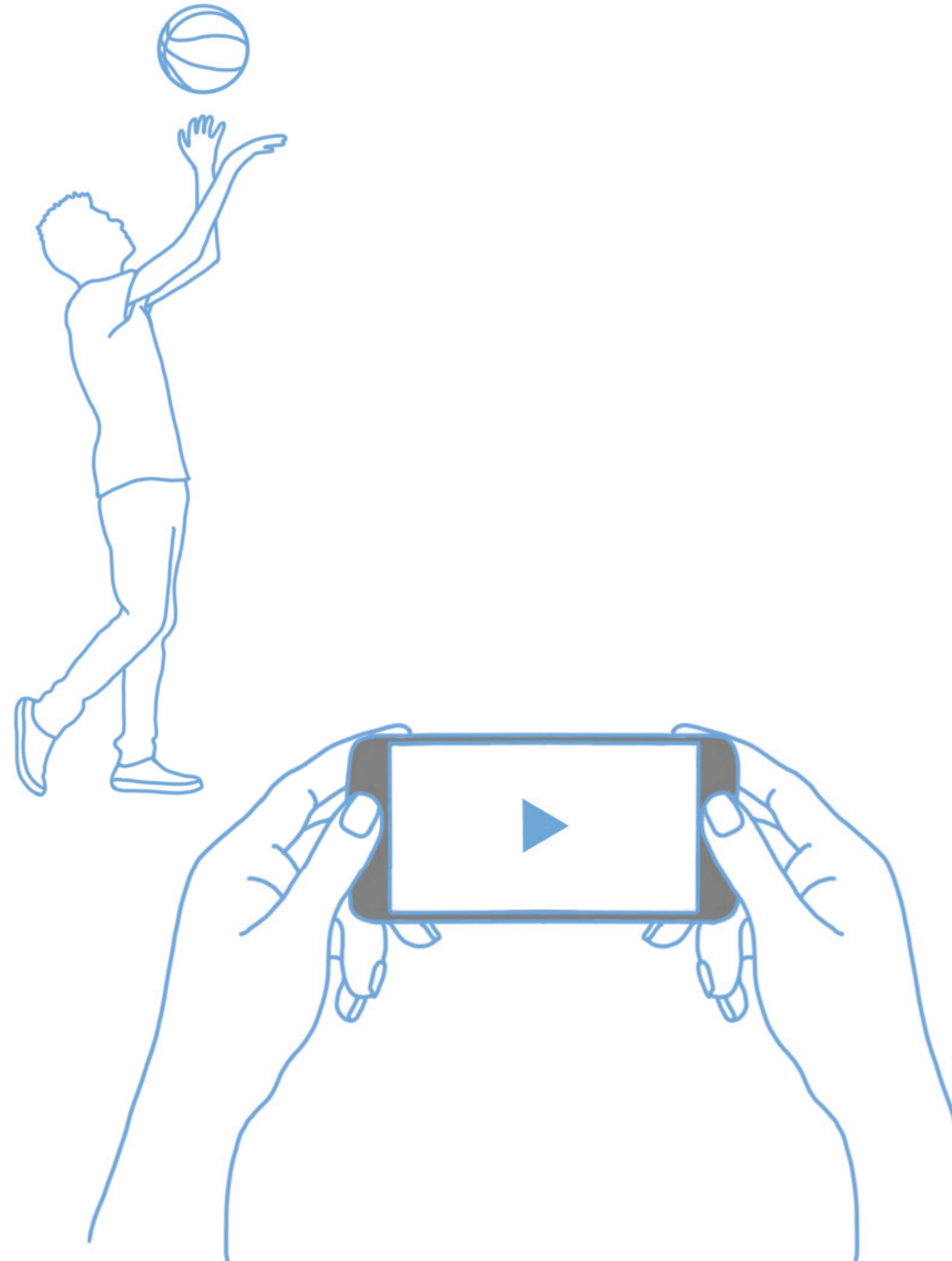
3D/4D Movies



Roller-coaster Ride

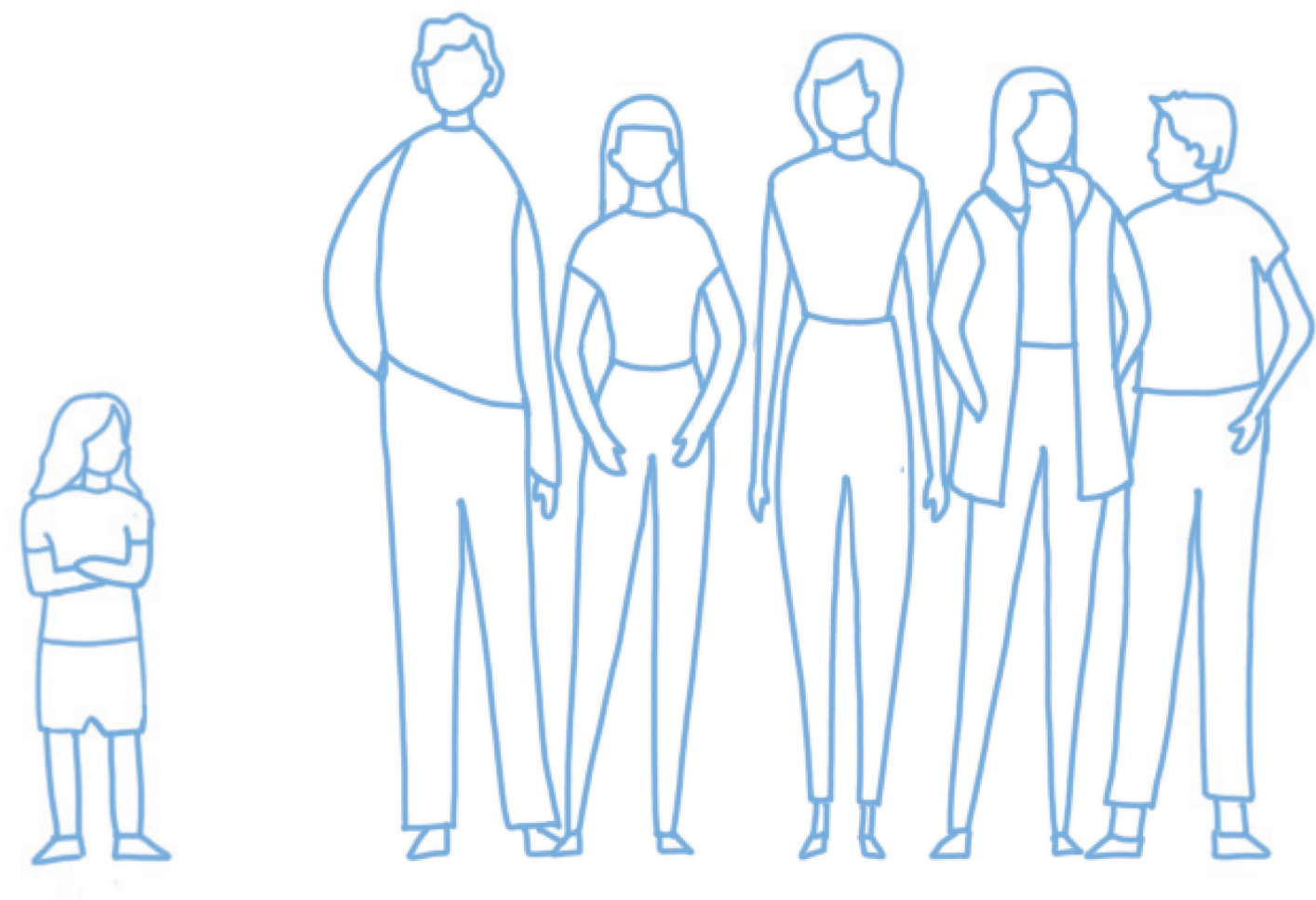
I decided to create a digital experience because it is more immersive.

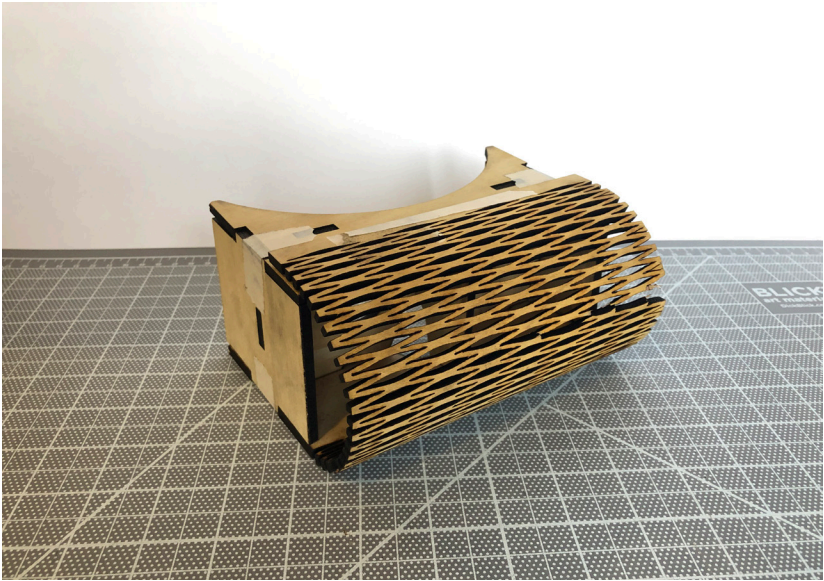
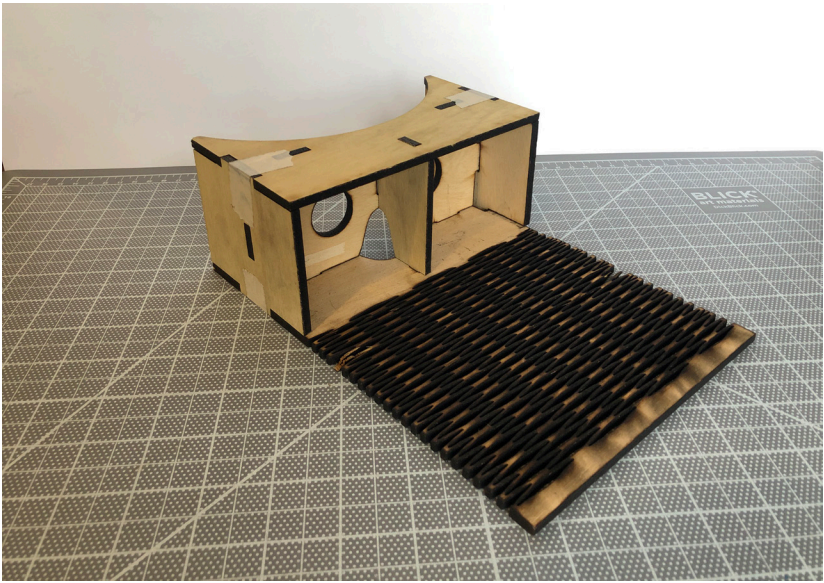
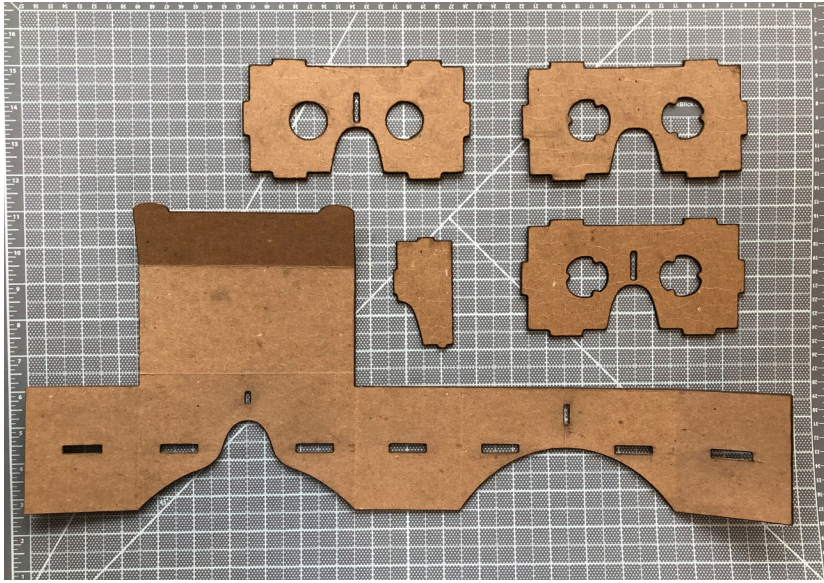
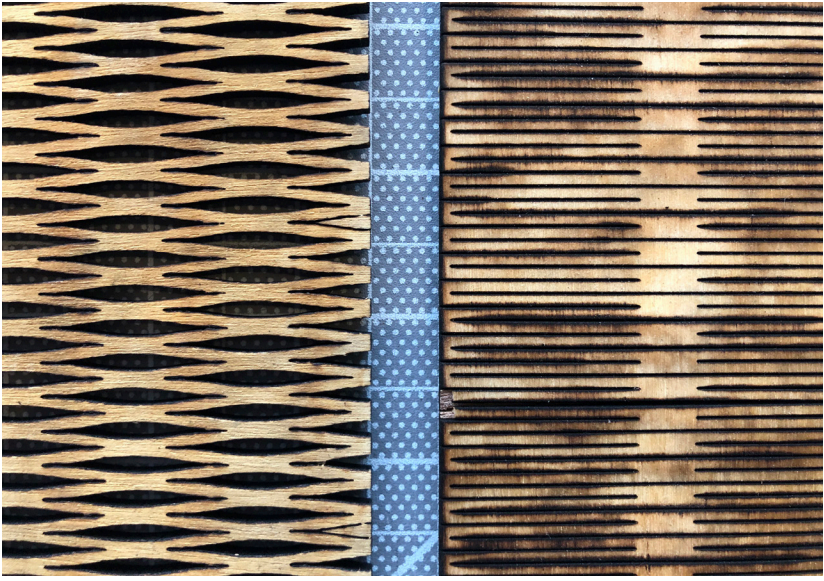
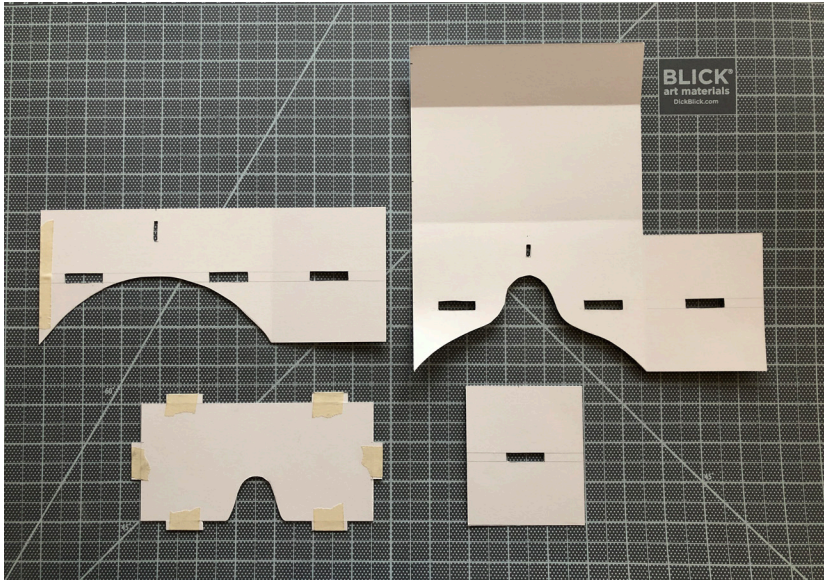
Moving forward, I needed to decide whether a physical game or a digital experience would be worth pursuing. After testing both ideas, I decided that a digital experience would be more impactful, because you can be fully immersed into a new world and experience first-hand the challenges that children on the spectrum face while participating in sports.



I decided to create an individual experience rather than a group experience.

I had to decide whether my experience would be better for an individual to experience or for a group of people to experience at the same time. After testing both concepts, I decided to continue with an individual experience because I felt it would be more impactful and could be easily available to more people. Once users go through the experience, they can also share their thoughts with others who have also experienced the simulation.





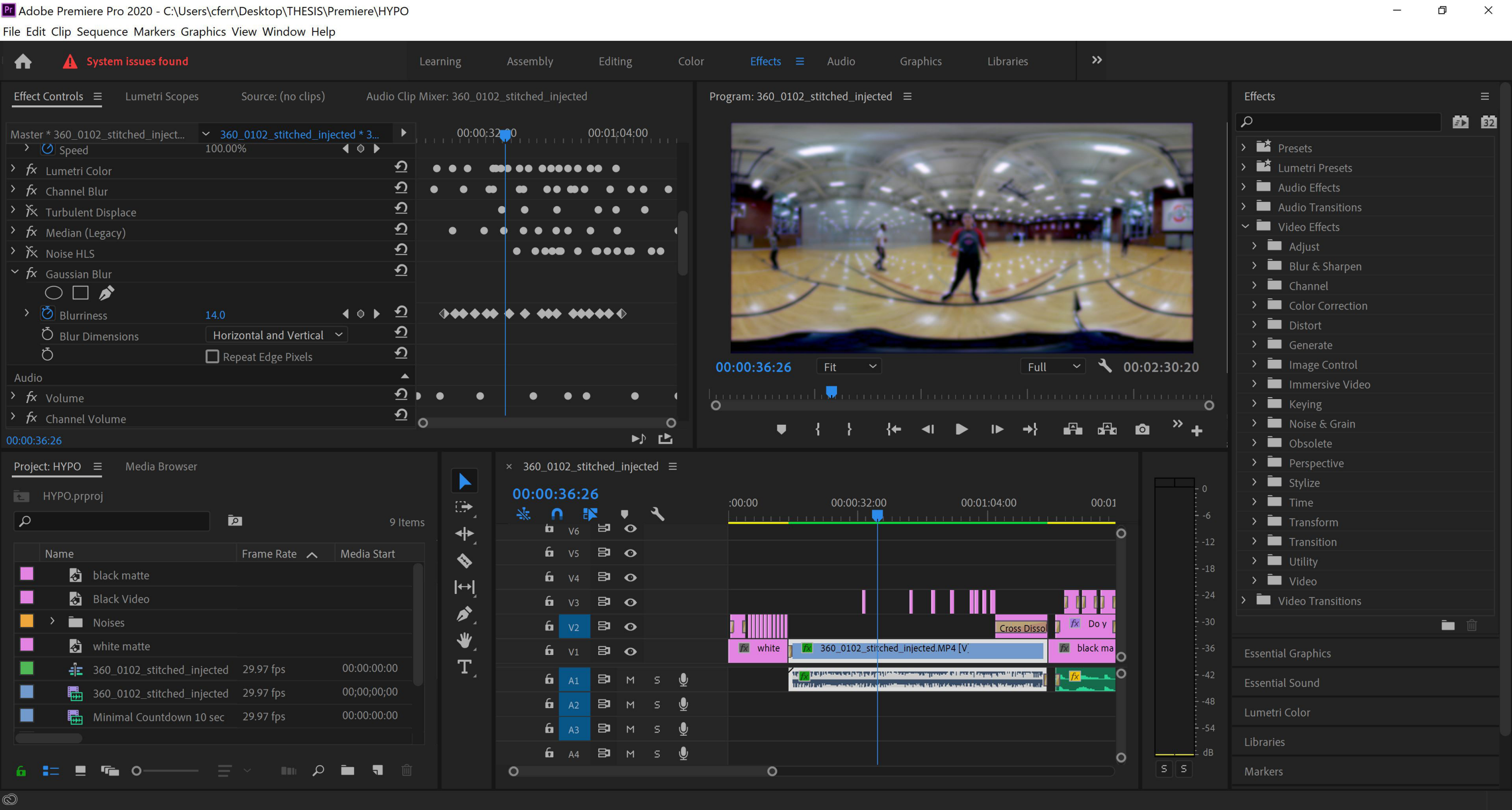


I needed to create a more immersive experience by using a 360-degree camera.

My original prototype was not a true virtual reality experience. Moving forward, I knew I needed to make my experience a full 360-degree video experience. By using a 360-degree camera, it would allow users to watch the video from any angle, also making the simulation video more immersive.



Hypersensitivity video



Hyposensitivity video

Window Autism Simulation is the first ever open source program kit to demonstrate the challenges children with Autism face while participating in sports to help the public to better understand Autism and the change they can make.



